1.

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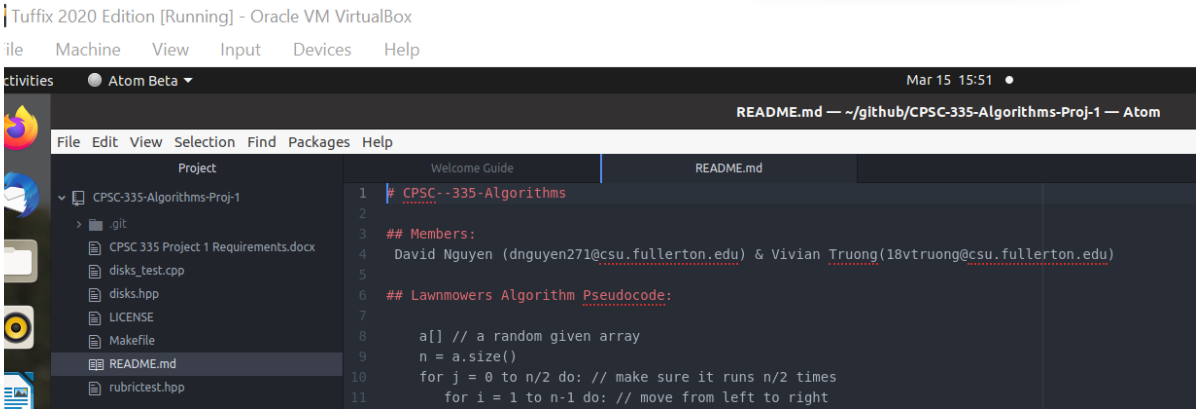
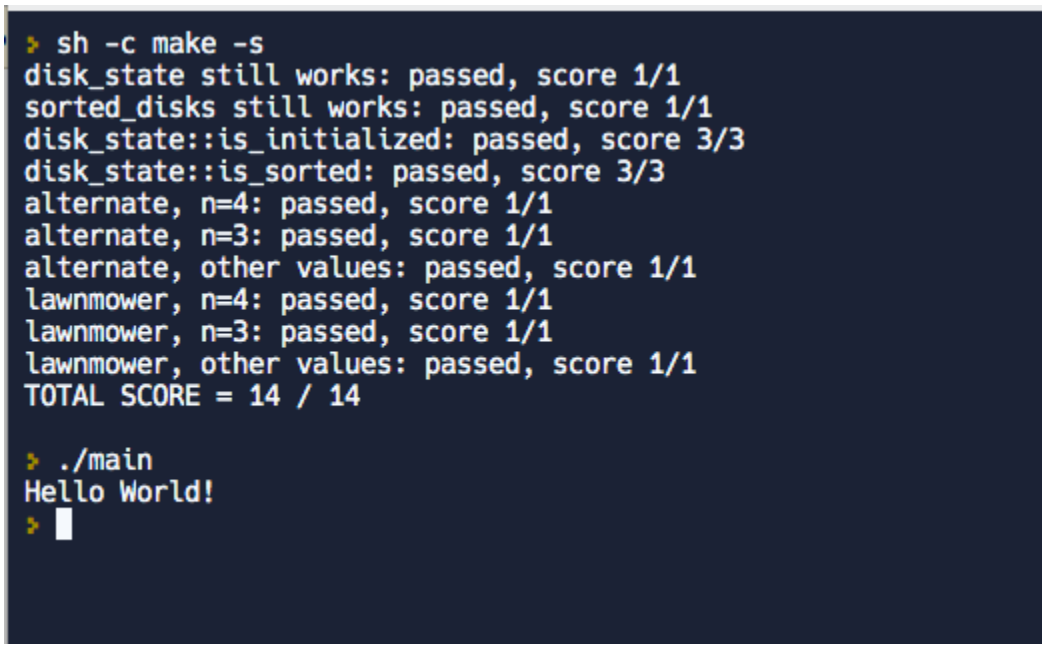
CPSC 335 Project 1

2. Screenshot inside Tuffix



3. Screenshot of execution



4. Step count and efficiency

Lawnmowers Algorithm Pseudocode:

```
a[] // a random given array

n = a.size()

for j = 0 to n/2 do: // make sure it runs n/2 times      n/2+1 times

   for i = 1 to n-1 do: // move from left to right       n-1 times

       if (a[i] == black && a[i+1] != black): // check for swappable elements    3 tu

           swap;


//      S.C. = 3(n^2-n)/2 + 3n-3

   for j = n-1 down to 1 do:  // move from right to left     n-1 times

       if(a[j] == white && a[j-1] != white): // check for swappable elements     3 tu

            swap;

            //    S.C. = 2n-2 so final step count 3n^2-9n+12/2 . Time complexity is O(n^2)
```

Alternate Algorithm Pseudocode:

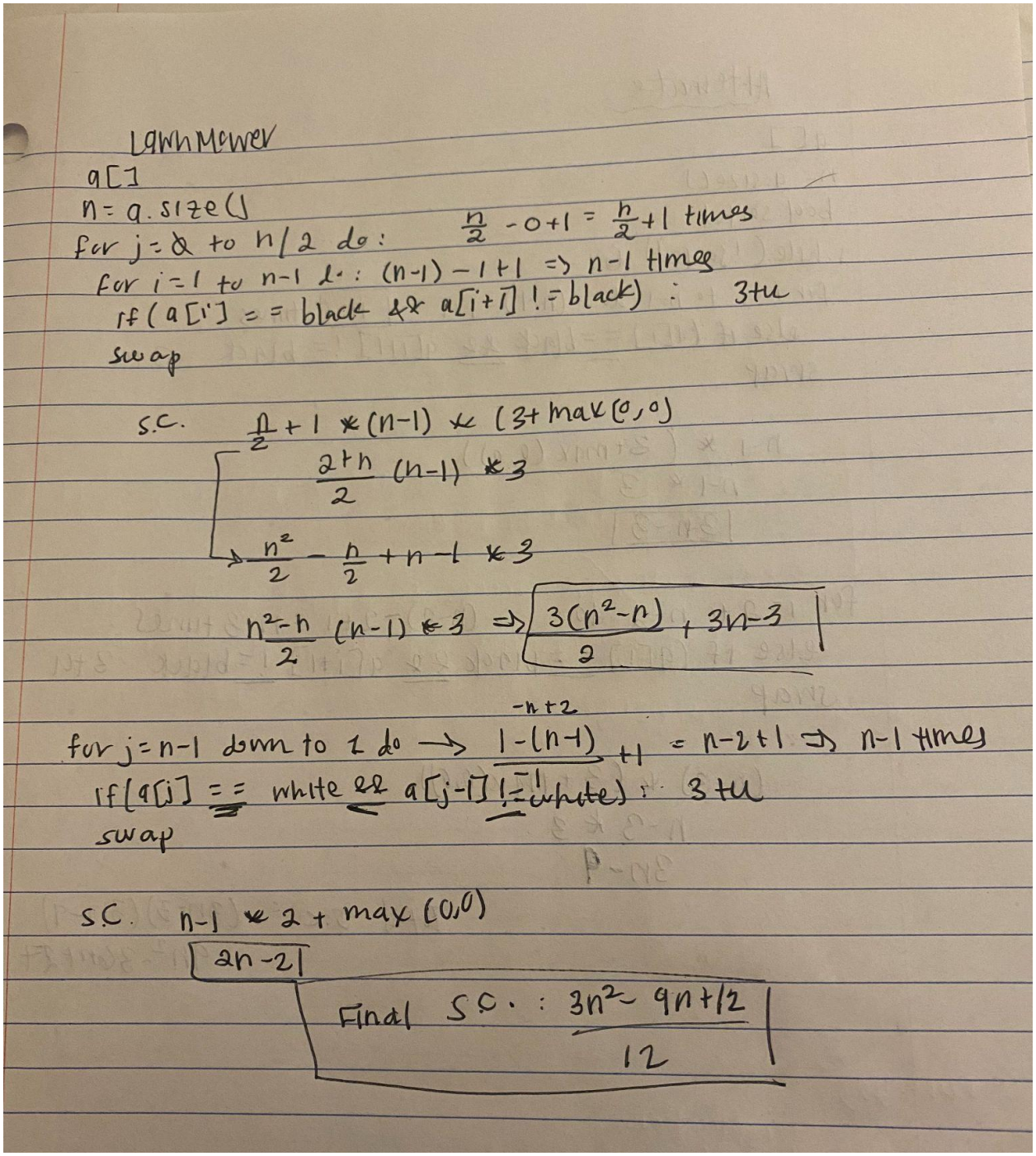
```
a[] // a random given array

n = a.size()
```

```
bool sorted

while(!sorted) do:

   for i = 1 to n-1 do:  // move from left to right
n-1 times

       else if (a[i] == black && a[i+1] != black): // check for
swappable elements   3 tu

           swap;


//                        S.C.: 3n-3

   for i = 2 to n-2 do: // check the secondleft to secondright
disc      n-3 times

       else if (a[i] == black && a[i+1] != black): // check for
swappable elements      3 tu

           swap;

           //                       S.C.: 3n-9 so 9n^2-36n+27 .
Time complexity is O(n^2)
```

5. Time Complexity

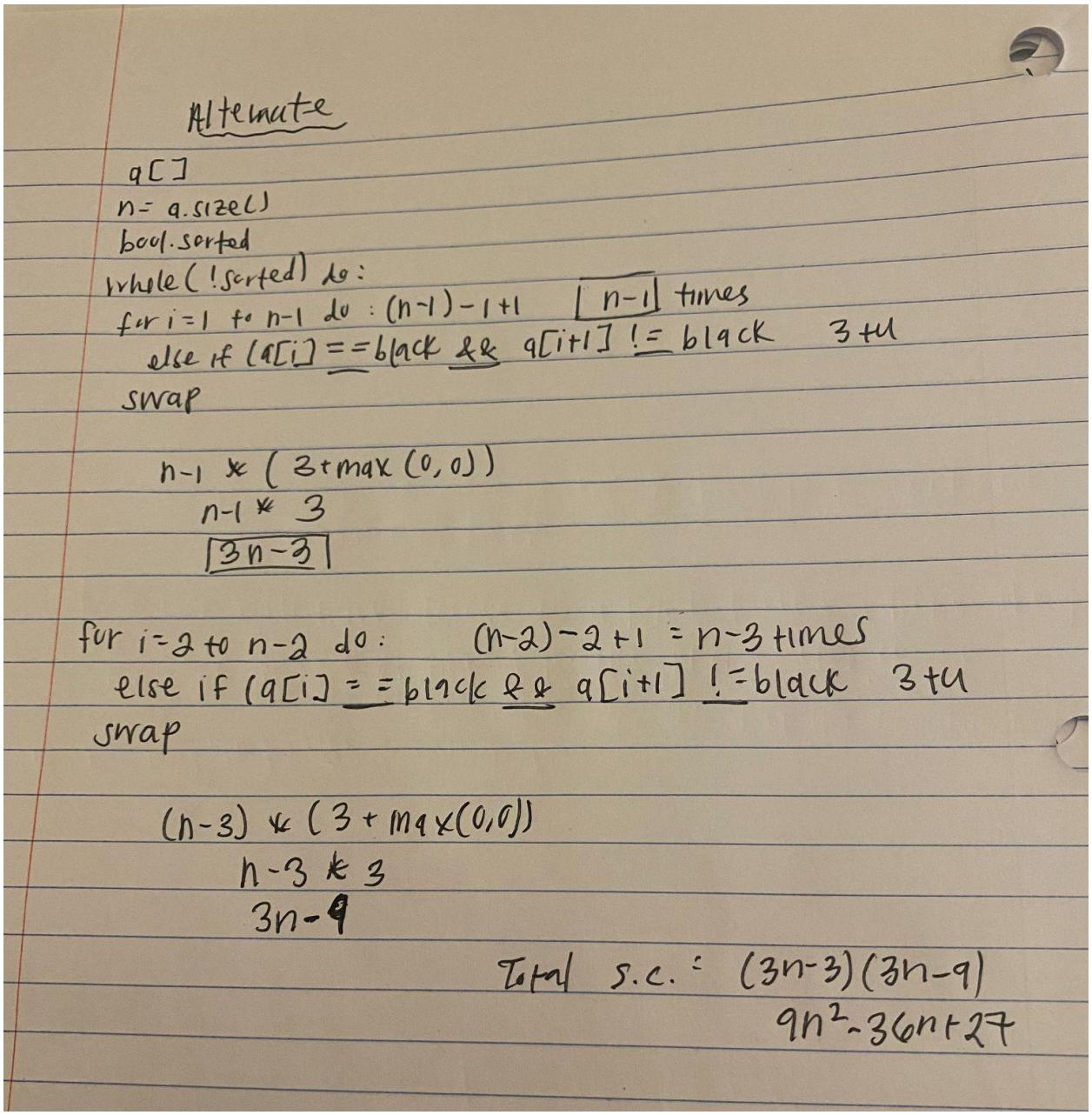
We have concluded that both pseudocode algorithms are O(n^2) based on the leading terms.

Lawnmowers:



Time complexity: O(n^2)

Alternate:



Time complexity: O(n^2)